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# UNIVERSITI SAINS MALAYSIA

First Semester Examination  
Academic Session 2001/2002

September 2001

## **CSC504 – Human Computer Interaction**

Duration : 3 jam

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### **INSTRUCTION TO CANDIDATE:**

- Please ensure that this examination paper contains **SIX** questions in **FIVE** printed pages before you start the examination.
  - Answer **FIVE** questions.
  - You can choose to answer either in Bahasa Malaysia or English.
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ENGLISH VERSION OF THE QUESTION PAPER

1. This question revolves around the design of an information kiosk e.g. for an airport, a building or a university campus. It is important that such a system be designed properly as the system will be used by a plethora of users and many of whom will be using it for the first time and in many instances also for the last time.
  - (a) Suggest ideas on how Fitt's Law may be applied to the design of an information kiosk.

(15/100)
  - (b) Are the three different types of human memory relevant to the use of an information kiosk? Explain.

(20/100)
  - (c) Discuss whether the theory of forgetting, namely interference should be considered in the design of an information kiosk. Include in your discussion the two types of interference namely retroactive interference and proactive interference.

(25/100)
  - (d) Most information kiosks are provided with a single input device. Suggest an input device that you think will be the:
    - (i) best possible
    - (ii) next best possible
    - (iii) the worst possible
    - (iv) the next worst possiblefor an information kiosk. Explain your answer.

(40/100)
2. This question revolves around the design of an information kiosk. Please refer to Question 1 for a brief explanation of an information kiosk.
  - (a) The physical environment (in the context of health issues) that affects quality of interaction may include the following aspects: (i) physical position, (ii) lighting and (iii) auditory environment/noise. Describe the possible adverse consequences of NOT giving due regard during the design of an information kiosk, to TWO of the above aspects.

(20/100)

- (b) Discuss how direct manipulation interfaces can be used effectively on an information kiosk.  
(25/100)
- (c) Which of the three categories of principles of usability is the most important when designing an information kiosk? Explain.  
(20/100)
- (d) Choose carefully one contributory or supporting principle of the category of principle that you have chosen in 2(c) above that you think is the most important. Discuss briefly how you would achieve the goal of this supporting principle in the design of an information kiosk.  
(35/100)
3. (a) Discuss the problems associated with the traditional 'waterfall model' of software development when designing interactive systems.  
(25/100)
- (b) Describe, how task analysis can be incorporated into the system lifecycle and how the incorporation overcomes the problems that you've mentioned in 3(a) above.  
(25/100)
- (c) Perform a mental walk-through of the process typically involved in paying a visit to a cinema (cinplex) starting from the moment you enter the complex knowing the movie to watch, up to the point when you leave the complex. Perform a task analysis on the process and give the task decomposition and plans as well as the HTA (Hierarchical Task Analysis) diagram.  
(30/100)
- (d) In the last decade there has been the emergence of many rapid prototyping tools. Discuss the effect this has had on the design of interactive systems.  
(20/100)
4. (a) Briefly define and contrast analytic and observational approaches to interface evaluation, giving three criteria you would use in selecting a particular technique.  
(20/100)

- (b) You have been asked to compare two interfaces with respect to the following usability objectives:

- suitability for task
- learnability

Briefly outline how you would do this, including:

- (i) evaluation technique(s) chosen
- (ii) usability metrics used
- (iii) the kind(s) of data collected and its analysis

(50/100)

- (c) There are "to date" two main paradigms of programming interactive system, read-evaluation loop based and notification based. Briefly explain the paradigms, and discuss the limitations and benefits of the paradigms. Give an example (one from each paradigm) of tool or engine that implements the paradigm.

(30/100)

5. (a) Apply the notion of "social presence" (seamless transition) to the design of a video conferencing system to support collaboration between geographically distributed work groups. Explain how a designer could support seamlessness in such a system, and discuss potential problems arising from such a design.

(30/100)

- (b) Explain why it is important to understand the nature of co-operative work and to study work practices in the customer organisation prior to designing a CSCW application.

(30/100)

- (c) Discuss some of the main issues to be considered when implementing a synchronous-remote groupware systems. Your discussion may include the following factors:

- Architecture
- Network Delay and Bandwidth
- Floor policy control and
- Reliability and Scaling

(40/100)

6. (a) Supposed you have been asked to design an interactive system e.g. an automatic pilot system, which include speech in its interface. Specify and justify your choice of the level of speech interaction you wish to support. In your answer, you may consider the following tasks performs by the end-users:

- Control - telling the system what to do; for example "turn left, 30 degree".
- Recording - simply recording and replaying messages or annotations
- Transcription - turning speech into text as in word processor

For each of the level you chose and the medium you used i.e. speech vs non-speech, discuss the limitations and benefits of them.

(70/100)

- (b) Define and contrast hypertext and hypermedia. Briefly discuss problem with hypermedia in an interactive system.

(30/100)